

SEQUENCE LISTING

<110> Milich, David R.
 Billaud, Jean-Noel
 <120> Hepatitis B Virus Core Proteins as Vaccine Platforms and Methods
 of Use Thereof
 <130> VACCINE-08820
 <160> 256
 <170> PatentIn version 3.2
 <210> 1
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 <213> Woodchuck hepatitis virus
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Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
 50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
 65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
 145 150 155 160

Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
165 170 175

Arg Arg Arg Arg Ser Gln Ser Pro Ser Ala Asn Cys
180 185

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<213> Woodchuck hepatitis virus

<400> 2

Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser Pro Arg Arg Arg Thr
1 5 10 15

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
20 25 30

Gln Ser Pro Ser Ala Asn Cys
35

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<213> Woodchuck hepatitis virus

<400> 3

Arg Arg Arg Cys
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<210> 4
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<400> 4

Arg Arg Arg Arg Cys
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<210> 5
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<213> Woodchuck hepatitis virus

<400> 5

Lys Lys Lys Cys
1

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<213> Woodchuck hepatitis virus

<400> 6

Ala Ala Ala Cys
1

<210> 7
<211> 23
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<213> Woodchuck hepatitis virus

<400> 7

Ala Ala Gly Gly Ala Arg Ala Ser Arg Ser Pro Ser Gln Ser Pro Ser
1 5 10 15

Gln Ser Pro Ser Ala Asn Cys
20

<210> 8
<211> 21
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<213> Woodchuck hepatitis virus

<400> 8

Ala Ala Gly Gly Ala Arg Ala Ser Arg Ser Gln Ser Pro Ser Gln Ser
1 5 10 15

Pro Ser Ala Asn Cys
20

<210> 9
<211> 20
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<213> Woodchuck hepatitis virus

<400> 9

Ala Ala Gly Gly Ala Arg Ala Ser Arg Ser Gln Ser Ser Gln Ser Pro
1 5 10 15

Ser Ala Asn Cys
20

<210> 10
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 <213> Woodchuck hepatitis virus

<400> 10

Ala Ala Gly Gly Ala Arg Ala Ser Arg Ser Gln Ser Ser Gln Ser Ser
 1 5 10 15

Ala Asn Cys

<210> 11
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 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 11

Arg Arg Gly Gly Ala Arg Ala Ser Gln Ser Ala Asn Cys
 1 5 10

<210> 12
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 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 12

Ala Arg Gly Gly Ala Arg Ala Ser Gln Ser Ala Asn Cys
 1 5 10

<210> 13
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 <213> Woodchuck hepatitis virus

<400> 13

Arg Ala Gly Gly Ala Arg Ala Ser Gln Ser Ala Asn Cys
 1 5 10

<210> 14
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 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 14

Ala Ala Gly Gly Ala Arg Ala Ser Gln Ser Ala Asn Cys
 1 5 10

<210> 15
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 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 15

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Arg Glu Ser
 1 5 10 15

Gln Cys

<210> 16
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 <213> Woodchuck hepatitis virus

<400> 16

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Pro Ser Ala
 1 5 10 15

Asn Cys

<210> 17
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 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 17

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Ser Ala Asn
 1 5 10 15

Cys

<210> 18
 <211> 15
 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 18

Ala Ala Gly Arg Ser Gln Ser Pro Ser Gln Ser Ser Ala Asn Cys
 1 5 10 15

<210> 19
 <211> 16
 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 19

Ala Ala Gly Arg Ser Pro Ser Gln Ser Ser Gln Ser Ser Ala Asn Cys
 1 5 10 15

<210> 20
 <211> 14
 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 20

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Ser Ala Asn Cys
 1 5 10

<210> 21
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 <212> PRT
 <213> Ground squirrel hepatitis virus

<400> 21

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
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Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Ala Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Glu Glu
 50 55 60

Leu Thr Arg Leu Ile Thr Trp Met Ser Glu Asn Thr Thr Glu Glu Val
 65 70 75 80

Arg Arg Ile Ile Val Asp His Val Asn Asn Thr Trp Gly Leu Lys Val
 85 90 95

Arg Gln Thr Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln His
 100 105 110

Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro
 115 120 125

Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu
130 135 140

His Thr Val Ile Arg Arg Arg Gly Gly Ser Arg Ala Ala Arg Ser Pro
145 150 155 160

Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg
165 170 175

Arg Arg Arg Ser Gln Ser Pro Ala Ser Asn Cys
180 185

<210> 22
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<212> PRT
<213> Ground squirrel hepatitis virus

<400> 22

Arg Arg Arg Gly Gly Ser Arg Ala Ala Arg Ser Pro Arg Arg Arg Thr
1 5 10 15

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
20 25 30

Gln Ser Pro Ala Ser Asn Cys
35

<210> 23
<211> 23
<212> PRT
<213> Ground squirrel hepatitis virus

<400> 23

Ala Ala Gly Gly Ser Arg Ala Ala Arg Ser Pro Ser Gln Ser Pro Ser
1 5 10 15

Gln Ser Pro Ala Ser Asn Cys
20

<210> 24
<211> 21
<212> PRT
<213> Ground squirrel hepatitis virus

<400> 24

Ala Ala Gly Gly Ser Arg Ala Ala Arg Ser Gln Ser Pro Ser Gln Ser
1 5 10 15

Pro Ala Ser Asn Cys
20

<210> 25

<211> 20

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 25

Ala Ala Gly Gly Ser Arg Ala Ala Arg Ser Gln Ser Ser Gln Ser Pro
1 5 10 15

Ala Ser Asn Cys
20

<210> 26

<211> 19

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 26

Ala Ala Gly Gly Ser Arg Ala Ala Arg Ser Gln Ser Ser Gln Ser Ala
1 5 10 15

Ser Asn Cys

<210> 27

<211> 14

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 27

Arg Arg Gly Gly Ser Arg Ala Ala Ser Gln Ala Ser Asn Cys
1 5 10

<210> 28

<211> 14

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 28

Ala Arg Gly Gly Ser Arg Ala Ala Ser Gln Ala Ser Asn Cys
1 5 10

<210> 29
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 <213> Ground squirrel hepatitis virus

<400> 29

Arg Ala Gly Gly Ser Arg Ala Ala Ser Gln Ala Ser Asn Cys
 1 5 10

<210> 30
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 <213> Ground squirrel hepatitis virus

<400> 30

Ala Ala Gly Gly Ser Arg Ala Ala Ser Gln Ala Ser Asn Cys
 1 5 10

<210> 31
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 <212> PRT
 <213> Ground squirrel hepatitis virus

<400> 31

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Arg Glu Ser
 1 5 10 15

Gln Cys

<210> 32
 <211> 18
 <212> PRT
 <213> Ground squirrel hepatitis virus

<400> 32

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser
 1 5 10 15

Asn Cys

<210> 33
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 <212> PRT
 <213> Ground squirrel hepatitis virus

<400> 33

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Ala Ser Asn
 1 5 10 15

Cys

<210> 34

<211> 15

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 34

Ala Ala Gly Arg Ser Gln Ser Pro Ser Gln Ser Ala Ser Asn Cys
 1 5 10 15

<210> 35

<211> 16

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 35

Ala Ala Gly Arg Ser Pro Ser Gln Ser Ser Gln Ser Ala Ser Asn Cys
 1 5 10 15

<210> 36

<211> 14

<212> PRT

<213> Ground squirrel hepatitis virus

<400> 36

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Ala Ser Asn Cys
 1 5 10

<210> 37

<211> 567

<212> DNA

<213> Woodchuck hepatitis virus

<400> 37

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 gagctaacag gtagggaaca ttgctctccg caccatacag ctattagaca agcttttagta 180
 tgctgggatg aattaactaa attgatagct tggatgagct ctaacataac ttctgaacaa 240
 gtaagaacaa tcattgtaaa tcatgtcaat gatacctggg gacttaaggt gagacaaagt 300
 ttatggtttc atttgtcatg tctcactttc ggacaacata cagttcaaga attttttagta 360
 agttttggag tatggatcag gactccagct ccatatagac ctctaatgc acccattctc 420

tcgactcttc cggaacatac agtcattagg agaagaggag gtgcaagagc ttctaggtcc 480
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 tctcaatctc catctgccaa ctgctga 567

<210> 38
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 <213> Woodchuck hepatitis virus

<400> 38

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
 50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
 65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu His Thr Val Ile
 145

<210> 39
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 <213> Ground squirrel hepatitis virus

<400> 39
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 gaattaacag gtagggagca ttgtttctct catcatactg ctattagaca ggccttagtg 180
 tgttggggaag aattaactag attaattaca tggatgagtg aaaatacaac agaagaagtt 240
 agaagaatta ttgttgatca tgtcaataat acttggggac ttaaagtaag acagacttta 300
 tggtttcatt tatcatgtct tacttttgga caacacacag ttcaagaatt tttggttagt 360
 tttggagtat ggattagaac tccagctcct tatagaccac ctaatgcacc cattttatca 420
 actcttccgg aacatacagt cattaggaga agaggagggt caagagctgc taggtcccc 480
 cgaagacgca ctccctctcc tcgcaggaga aggtctcaat caccgcgtcg cagacgtct 540
 caatctccag cttccaactg ctga 564

<210> 40
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 <212> PRT
 <213> Ground squirrel hepatitis virus

<400> 40
 Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
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 Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30
 Thr Ala Ala Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Glu Glu
 50 55 60
 Leu Thr Arg Leu Ile Thr Trp Met Ser Glu Asn Thr Thr Glu Glu Val
 65 70 75 80
 Arg Arg Ile Ile Val Asp His Val Asn Asn Thr Trp Gly Leu Lys Val
 85 90 95
 Arg Gln Thr Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln His
 100 105 110

Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro
 115 120 125

Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu
 130 135 140

His Thr Val Ile
 145

<210> 41
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 <212> PRT
 <213> Human hepatitis B virus

<400> 41

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys
 85 90 95

Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
 165 170 175

Gln Ser Arg Glu Ser Gln Cys
 180

<210> 42
 <211> 34
 <212> PRT
 <213> Human hepatitis B virus
 <400> 42

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
 1 5 10 15

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Arg Glu Ser
 20 25 30

Gln Cys

<210> 43
 <211> 18
 <212> PRT
 <213> Human hepatitis B virus
 <400> 43

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Arg Glu Ser
 1 5 10 15

Gln Cys

<210> 44
 <211> 16
 <212> PRT
 <213> Human hepatitis B virus
 <400> 44

Ala Ala Gly Arg Ser Gln Ser Pro Ser Gln Ser Arg Glu Ser Gln Cys
 1 5 10 15

<210> 45
 <211> 15
 <212> PRT
 <213> Human hepatitis B virus
 <400> 45

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Arg Glu Ser Gln Cys
 1 5 10 15

<210> 46
<211> 14
<212> PRT
<213> Human hepatitis B virus

<400> 46

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Glu Ser Gln Cys
1 5 10

<210> 47
<211> 11
<212> PRT
<213> Human hepatitis B virus

<400> 47

Arg Arg Gly Ser Gln Ser Arg Glu Ser Gln Cys
1 5 10

<210> 48
<211> 11
<212> PRT
<213> Human hepatitis B virus

<400> 48

Ala Arg Gly Ser Gln Ser Arg Glu Ser Gln Cys
1 5 10

<210> 49
<211> 11
<212> PRT
<213> Human hepatitis B virus

<400> 49

Arg Ala Gly Ser Gln Ser Arg Glu Ser Gln Cys
1 5 10

<210> 50
<211> 11
<212> PRT
<213> Human hepatitis B virus

<400> 50

Ala Ala Gly Ser Gln Ser Arg Glu Ser Gln Cys
1 5 10

<210> 51
 <211> 18
 <212> PRT
 <213> Human hepatitis B virus

<400> 51

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Pro Ser Ala
 1 5 10 15

Asn Cys

<210> 52
 <211> 18
 <212> PRT
 <213> Human hepatitis B virus

<400> 52

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Arg Glu Ser
 1 5 10 15

Gln Cys

<210> 53
 <211> 17
 <212> PRT
 <213> Human hepatitis B virus

<400> 53

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Glu Ser Gln
 1 5 10 15

Cys

<210> 54
 <211> 15
 <212> PRT
 <213> Human hepatitis B virus

<400> 54

Ala Ala Gly Arg Ser Gln Ser Pro Ser Gln Ser Glu Ser Gln Cys
 1 5 10 15

<210> 55
 <211> 16
 <212> PRT
 <213> Human hepatitis B virus

<400> 55

Ala Ala Gly Arg Ser Pro Ser Gln Ser Ser Gln Ser Glu Ser Gln Cys
 1 5 10 15

<210> 56
 <211> 14
 <212> PRT
 <213> Human hepatitis B virus

<400> 56

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Glu Ser Gln Cys
 1 5 10

<210> 57
 <211> 552
 <212> DNA
 <213> Human hepatitis B virus

<400> 57
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 gccttagagt ctcttgagca ttgttcacct caccatactg cactcaggca agcaattctt 180
 tgctgggggg aactaatgac tctagctacc tgggtgggtg ttaatttgga agatccagca 240
 tccagagacc tagtagtcag ttatgtcaac actaatatgg gcctaaagtt caggcaactc 300
 ttgtggtttc acatttcttg tctcactttt ggaagagaaa ccgttataga gtatttggtg 360
 tctttcggag tgtggattcg cactcctcca gcttatagac caccaaagtc ccctatccta 420
 tcaacacttc cggaactac tgttgtaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgctc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
 tctcaatggt ga 552

<210> 58
 <211> 149
 <212> PRT
 <213> Human hepatitis B virus

<400> 58

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60
 Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala
 65 70 75 80
 Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys
 85 90 95
 Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110
 Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125
 Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu Thr Thr Val Val
 145

<210> 59
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 59

Val Ser Phe Gly Val Trp Ile Arg Thr Pro Ala Pro
 1 5 10

<210> 60
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 60

Val Ser Phe Gly Val Trp Ile Arg Thr Pro Pro Ala
 1 5 10

<210> 61
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 61

Val Cys Trp Asp Glu Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn
 1 5 10 15

Ile Thr Ser Glu Gln
 20

<210> 62
 <211> 21
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 62

Leu Cys Trp Gly Glu Leu Met Thr Leu Ala Thr Trp Val Gly Gly Asn
 1 5 10 15

Leu Glu Asp Pro Ile
 20

<210> 63
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 63
 ggaaattcctt ctctcgag

19

<210> 64
 <211> 24
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 64

Met Ser Leu Leu Thr Glu Val Glu Thr Pro Ile Arg Asn Glu Trp Gly
1 5 10 15

Cys Arg Cys Asn Asp Ser Ser Asp
20

<210> 65

<211> 18

<212> PRT

<213> Plasmodium vivax

<400> 65

Ala Asn Gly Ala Gly Asn Gln Pro Gly Ala Asn Gly Ala Gly Asp Gln
1 5 10 15

Pro Gly

<210> 66

<211> 18

<212> PRT

<213> Plasmodium vivax

<400> 66

Ala Asn Gly Ala Asp Asn Gln Pro Gly Ala Asn Gly Ala Asp Asp Gln
1 5 10 15

Pro Gly

<210> 67

<211> 22

<212> PRT

<213> Plasmodium vivax

<400> 67

Ala Pro Gly Ala Asn Gln Glu Gly Gly Ala Ala Ala Pro Gly Ala Asn
1 5 10 15

Gln Glu Gly Gly Ala Ala
20

<210> 68

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 68

Asn Ala Asn Pro Asn Ala Asn Pro Asn Ala Asn Pro
 1 5 10

<210> 69

<211> 260

<212> PRT

<213> Mus musculus

<400> 69

Met Ile Glu Thr Tyr Ser Gln Pro Ser Pro Arg Ser Val Ala Thr Gly
 1 5 10 15

Leu Pro Ala Ser Met Lys Ile Phe Met Tyr Leu Leu Thr Val Phe Leu
 20 25 30

Ile Thr Gln Met Ile Gly Ser Val Leu Phe Ala Val Tyr Leu His Arg
 35 40 45

Arg Leu Asp Lys Val Glu Glu Glu Val Asn Leu His Glu Asp Phe Val
 50 55 60

Phe Ile Lys Lys Leu Lys Arg Cys Asn Lys Gly Glu Gly Ser Leu Ser
 65 70 75 80

Leu Leu Asn Cys Glu Glu Met Arg Arg Gln Phe Glu Asp Leu Val Lys
 85 90 95

Asp Ile Thr Leu Asn Lys Glu Glu Lys Lys Glu Asn Ser Phe Glu Met
 100 105 110

Gln Arg Gly Asp Glu Asp Pro Gln Ile Ala Ala His Val Val Ser Glu
 115 120 125

Ala Asn Ser Asn Ala Ala Ser Val Leu Gln Trp Ala Lys Lys Gly Tyr
 130 135 140

Tyr Thr Met Lys Ser Asn Leu Val Met Leu Glu Asn Gly Lys Gln Leu
 145 150 155 160

Thr Val Lys Arg Glu Gly Leu Tyr Tyr Val Tyr Thr Gln Val Thr Phe
 165 170 175

Cys Ser Asn Arg Glu Pro Ser Ser Gln Arg Pro Phe Ile Val Gly Leu
 180 185 190

Trp Leu Lys Pro Ser Ser Gly Ser Glu Arg Ile Leu Leu Lys Ala Ala
 195 200 205

Asn Thr His Ser Ser Ser Gln Leu Cys Glu Gln Gln Ser Val His Leu
 210 215 220

Gly Gly Val Phe Glu Leu Gln Ala Gly Ala Ser Val Phe Val Asn Val
 225 230 235 240

Thr Glu Ala Ser Gln Val Ile His Arg Val Gly Phe Ser Ser Phe Gly
 245 250 255

Leu Leu Lys Leu
 260

<210> 70
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 70

Gly Glu Ile Lys Asn Cys Ser Phe Asn Ile Ser Thr Ser Ile Arg Gly
 1 5 10 15

Lys Val Gln Lys Glu Tyr Ala Phe Phe
 20 25

<210> 71
 <211> 26
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 71

Leu Thr Ser Cys Asn Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Val
 1 5 10 15

Ser Phe Glu Pro Ile Pro Ile His Tyr Cys
 20 25

<210> 72
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 72

Pro Lys Val Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala
1 5 10 15

Gly Phe Ala Ile Leu Lys Cys Asn Asn
20 25

<210> 73
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 73

Thr His Gly Ile Arg Pro Val Val Ser Thr Gln Leu Leu Leu Asn Gly
1 5 10 15

Ser Leu Ala Glu Glu Glu
20

<210> 74
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 74

Asp Arg Ala Ala Gly Gln Pro Ala Gly Asp Arg Ala Asp Gly Gln Pro
1 5 10 15

Ala Gly

<210> 75
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 75

Asn Ala Asn Pro Asn Val Asp Pro Asn Ala Asn Pro Asn Ala Asn Pro
1 5 10 15

Asn Ala Asn Pro
20

<210> 76

<211> 23

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 76

Ser Leu Leu Thr Glu Val Glu Thr Pro Ile Arg Asn Glu Trp Gly Cys
1 5 10 15

Arg Cys Asn Asp Ser Ser Asp
20

<210> 77

<211> 23

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 77

Ser Leu Leu Thr Glu Val Glu Thr Pro Ile Arg Asn Glu Trp Gly Ala
1 5 10 15

Arg Ala Asn Asp Ser Ser Asp
20

<210> 78

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 78

Lys Lys Lys Val Thr Ala Gln Glu Leu Asp
1 5 10

<210> 79
 <211> 16
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 79

Phe	Gly	Phe	Pro	Glu	His	Leu	Leu	Val	Asp	Phe	Leu	Gln	Ser	Leu	Ser
1				5					10					15	

<210> 80
 <211> 22
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 80

Phe	Tyr	Glu	Ile	Ile	Met	Asp	Ile	Glu	Gln	Asn	Asn	Val	Gln	Gly	Lys
1				5					10					15	

Gln	Gly	Leu	Gln	Lys	Leu
					20

<210> 81
 <211> 18
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 81

Met	Glu	Leu	Arg	Lys	Asn	Gly	Arg	Gln	Cys	Gly	Met	Ser	Glu	Lys	Glu
1				5					10					15	

Glu	Glu
-----	-----

<210> 82
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 82

Leu	Glu	Glu	Lys	Lys	Gly	Asn	Tyr	Val	Val	Thr	Asp	His
1				5					10			

<210> 83
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 83

Asp Ala Glu Phe Arg His Asp Ser Gly Tyr Glu Val
1 5 10

<210> 84
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 84

Phe Arg His Asp Ser Gly Tyr
1 5

<210> 85
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 85

Arg Ile Lys Gln Ile Gly Met Pro Gly Gly Lys
1 5 10

<210> 86
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 86

Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu
1 5 10

<210> 87
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 87

Glu Gln Glu Leu Leu Glu Leu Asp Lys Trp Ala Ser Leu Trp
1 5 10

<210> 88
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 88

Asp Thr Gly Phe Leu Ala Ala Leu
1 5

<210> 89
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 89

Tyr Cys Phe Thr Pro Ser Pro Val
1 5

<210> 90
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 90

Cys Phe Arg Lys His Pro Glu Ala
1 5

<210> 91
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 91

Glu Ala Thr Tyr Ser Arg Cys Gly
 1 5

<210> 92
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 92

His Leu His Gln Asn Ile Val Asp
 1 5

<210> 93
 <211> 26
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 93

Arg Tyr Asn Arg Asn Ala Val Pro Asn Leu Arg Gly Asp Leu Gln Val
 1 5 10 15

Leu Ala Gln Lys Val Ala Arg Thr Leu Phe
 20 25

<210> 94
 <211> 11
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 94

Thr Ala Val Val His Gln Leu Lys Arg Lys His
 1 5 10

<210> 95
 <211> 16
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 95

His Leu Leu Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg
 1 5 10 15

<210> 96
 <211> 23
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 96

Gly Glu Thr Tyr Gln Ser Arg Val Thr His Pro His Leu Pro Arg Ala
 1 5 10 15

Leu Met Arg Ser Thr Thr Lys
 20

<210> 97
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 97

Gly Arg Glu Arg Arg Pro Arg Leu Ser Asp Arg Pro Gln Leu Pro Tyr
 1 5 10 15

Leu Glu Ala

<210> 98
 <211> 16
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 98

Asp Pro Pro Pro Pro Asn Pro Asn Asp Pro Pro Pro Pro Asn Pro Asn
 1 5 10 15

<210> 99

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 99

Glu Glu Lys Lys Lys Val Thr Ala Gln Glu Leu Asp Glu Glu
 1 5 10

<210> 100

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 100

Glu Glu Phe Arg His Asp Ser Gly Tyr Glu Glu
 1 5 10

<210> 101

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 101

Glu Glu Arg Ile Lys Gln Ile Gly Met Pro Gly Gly Lys Glu Glu
 1 5 10 15

<210> 102

<211> 187

<212> PRT

<213> Arctic ground squirrel hepatitis virus

<400> 102

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Glu Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Glu Glu
 50 55 60
 Leu Thr Arg Leu Ile Ala Trp Met Ser Ala Asn Ile Asn Ser Glu Glu
 65 70 75 80
 Val Arg Arg Val Ile Val Ala His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95
 Val Arg Gln Asn Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110
 His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Arg Ile Arg Thr
 115 120 125
 Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140
 Glu His Thr Val Ile Arg Arg Arg Gly Ser Ala Arg Val Val Arg Ser
 145 150 155 160
 Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
 165 170 175
 Arg Arg Arg Pro Gln Ser Pro Ala Ser Asn Cys
 180 185

<210> 103
 <211> 188
 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 103

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15
 Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30
 Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45
 Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
 50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
130 135 140

Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
145 150 155 160

Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Ser Gln Ser Pro
165 170 175

Arg Arg Arg Arg Ser Gln Ser Pro Ser Ala Asn Cys
180 185

<210> 104
<211> 188
<212> PRT
<213> Woodchuck hepatitis virus

<400> 104

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
 145 150 155 160

Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
 165 170 175

Arg Arg Arg Arg Ser Gln Ser Pro Ser Ala Asn Cys
 180 185

<210> 105
 <211> 187
 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 105

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
 50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
 65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Val Val Trp Ile Arg Thr
 115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu His Thr Val Ile Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser Pro
 145 150 155 160

Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg
 165 170 175

Arg Arg Arg Ser Gln Ser Pro Ser Ala Asn Cys
 180 185

<210> 106
 <211> 188
 <212> PRT
 <213> Woodchuck hepatitis virus

<400> 106

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
 50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
 65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
 145 150 155 160

Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
165 170 175

Arg Arg Arg Arg Ser Gln Ser Pro Ser Ala Asn Cys
180 185

<210> 107
<211> 188
<212> PRT
<213> Woodchuck hepatitis virus
<400> 107

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Asp Glu
50 55 60

Leu Thr Lys Leu Ile Ala Trp Met Ser Ser Asn Ile Thr Ser Glu Gln
65 70 75 80

Val Arg Thr Ile Ile Val Asn His Val Asn Asp Thr Trp Gly Leu Lys
85 90 95

Val Arg Gln Ser Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr
115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
130 135 140

Glu His Thr Val Ile Arg Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser
145 150 155 160

Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro
165 170 175

Arg Arg Arg Arg Ser Gln Ser Pro Ser Thr Asn Cys
180 185

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<210> 108
<211> 187
<212> PRT
<213> Ground squirrel hepatitis virus

<400> 108

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
1          5          10          15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Asp Leu Asn Ala Leu Val Asp
          20          25          30

Thr Ala Ala Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
          35          40          45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Glu Glu
          50          55          60

Leu Thr Arg Leu Ile Thr Trp Met Ser Glu Asn Thr Thr Glu Glu Val
65          70          75          80

Arg Arg Ile Ile Val Asp His Val Asn Asn Thr Trp Gly Leu Lys Val
          85          90          95

Arg Gln Thr Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln His
          100          105          110

Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Trp Ile Arg Thr Pro
          115          120          125

Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro Glu
          130          135          140

His Thr Val Ile Arg Arg Arg Gly Gly Ser Arg Ala Ala Arg Ser Pro
145          150          155          160

Arg Arg Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg
          165          170          175

Arg Arg Arg Ser Gln Ser Pro Ala Ser Asn Cys
          180          185

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<210> 109
<211> 183
<212> PRT
<213> Human hepatitis B virus

<400> 109

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
1          5          10          15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
          20          25          30

Thr Ala Ser Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys
          35          40          45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
          50          55          60

Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala
65          70          75          80

Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys
          85          90          95

Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Ile Phe Gly Arg
          100          105          110

Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
          115          120          125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
          130          135          140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145          150          155          160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
          165          170          175

Gln Ser Arg Glu Ser Gln Cys
          180

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<210> 110
 <211> 185
 <212> PRT
 <213> Human hepatitis B virus

<400> 110

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Asp Leu Val Val Asn Tyr Val Asn Thr Asn Val Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Asp Arg Gly Arg Ser Pro Arg Arg
 145 150 155 160

Arg Thr Pro Ser Pro Arg Arg Arg Arg Ser Pro Ser Pro Arg Arg Arg
 165 170 175

Arg Ser Gln Ser Arg Glu Ser Gln Cys
 180 185

<210> 111
 <211> 183
 <212> PRT
 <213> Human hepatitis B virus

<400> 111

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60

Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Ser
 165 170 175

Gln Ser Arg Glu Ser Gln Cys
 180

<210> 112

<211> 183

<212> PRT

<213> Human hepatitis B virus

<400> 112

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Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1          5          10          15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
          20          25          30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
          35          40          45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50          55          60

Leu Met Thr Leu Ala Thr Trp Val Gly Val Asn Leu Glu Asp Pro Ala
65          70          75          80

Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Met Gly Leu Lys
          85          90          95

Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
          100          105          110

Glu Thr Val Ile Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
          115          120          125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
          130          135          140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145          150          155          160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
          165          170          175

Gln Ser Arg Glu Ser Gln Cys
          180

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<210> 113

<211> 183

<212> PRT

<213> Human hepatitis B virus

<400> 113

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ala Ala Leu Tyr Arg Asp Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Asp
 50 55 60

Leu Met Thr Leu Ala Thr Trp Val Gly Thr Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Asp Leu Val Val Ser Tyr Val Asn Thr Asn Val Gly Leu Lys
 85 90 95

Phe Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
 165 170 175

Gln Ser Arg Glu Ser Gln Cys
 180

<210> 114

<211> 183

<212> PRT

<213> Human hepatitis B virus

<400> 114

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Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Ser Val Glu Leu Leu
1          5          10          15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Ile Arg Asp Leu Leu Asp
          20          25          30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
          35          40          45

Ser Pro His His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
          50          55          60

Leu Met Asn Leu Ala Thr Trp Val Gly Ser Asn Leu Glu Asp Pro Ala
65          70          75          80

Ser Arg Glu Leu Val Val Ser Tyr Val Asn Val Asn Met Gly Leu Lys
          85          90          95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
          100          105          110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
          115          120          125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
          130          135          140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
145          150          155          160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
          165          170          175

Gln Ser Arg Glu Ser Gln Cys
          180

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<210> 115

<211> 183

<212> PRT

<213> Chimpanzee hepatitis B virus

<400> 115

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro Asn His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Ser Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Gln Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser
 165 170 175

Gln Ser Pro Ala Ser Gln Cys
 180

<210> 116

<211> 183

<212> PRT

<213> Gibbon hepatitis B virus

<400> 116

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro Asn His Thr Ala Leu Arg Gln Ala Val Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Ser Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Leu Val Val Ser Tyr Val Asn Asn Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Ser
 165 170 175

Gln Ser Pro Ala Ser Gln Cys
 180

<210> 117

<211> 183

<212> PRT

<213> Orangutan hepatitis virus

<400> 117

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro Asn His Thr Ala Leu Arg Gln Ala Val Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Ser Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Leu Val Val Asn Tyr Val Asn Asn Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr
 145 150 155 160

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Ser
 165 170 175

Gln Ser Pro Ala Ser Gln Cys
 180

<210> 118

<211> 182

<212> PRT

<213> Woolly monkey hepatitis virus

<400> 118

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ala Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Ser Asp His Cys
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Thr Val Leu Cys Trp Gly Glu
 50 55 60

Leu Met Ser Leu Ala Ser Trp Val Gly Thr Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ala Arg Glu Leu Val Val Ser Tyr Val Asn Asp Asn Met Gly Leu Lys
 85 90 95

Val Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Trp Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val Arg Arg Arg Arg Pro Ser Gly Arg Arg Thr Pro
 145 150 155 160

Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln
 165 170 175

Ser Pro Ala Ser Ser Cys
 180

<210> 119

<211> 262

<212> PRT

<213> Duck hepatitis virus

<400> 119

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Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
1          5          10          15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
20          25          30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
35          40          45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
50          55          60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
65          70          75          80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
85          90          95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
100         105         110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
115         120         125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
130         135         140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
145         150         155         160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
165         170         175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
180         185         190

Ile Gln Val Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys
195         200         205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Phe Val
210         215         220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro
225         230         235         240

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Ile Gln Val Ala Gln Gly Gly Arg Lys Thr Thr Thr Gly Thr Arg Lys
 195 200 205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Thr Pro
 225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg
 245 250 255

Ser Pro Ser Pro Arg Lys
 260

<210> 121
 <211> 262
 <212> PRT
 <213> Duck hepatitis virus

<400> 121

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
180 185 190

Ile Gln Val Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys
195 200 205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Asp Arg Arg Ala Pro Ser Pro
225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg
245 250 255

Ser Pro Ser Pro Arg Lys
260

<210> 122
<211> 262
<212> PRT
<213> Duck hepatitis virus

<400> 122

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
65 70 75 80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys
 195 200 205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro
 225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg
 245 250 255

Ser Pro Ser Pro Arg Lys
 260

<210> 123
 <211> 262
 <212> PRT
 <213> Duck hepatitis virus
 <400> 123

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60
 Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80
 Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95
 Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110
 Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125
 Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140
 Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160
 Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175
 Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190
 Ile Gln Ala Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys
 195 200 205
 Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220
 Tyr Gly Arg Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro
 225 230 235 240
 Gln Arg Ala Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg
 245 250 255
 Ser Pro Ser Pro Arg Lys
 260

<210> 124
 <211> 262
 <212> PRT
 <213> Duck hepatitis virus

<400> 124

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Ala Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys
 195 200 205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro
 225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg
 245 250 255

Ser Pro Ser Pro Arg Lys
 260

<210> 125
 <211> 262
 <212> PRT
 <213> Ross' goose hepatitis virus

<400> 125

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Arg Asn Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ala Leu Arg Ala Ile Ile Pro Ala
 65 70 75 80

Thr Thr Ala Pro Val Pro Gln Gly Phe Leu Val Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Glu Leu Phe Arg Tyr Gln Glu Glu Arg Leu
 100 105 110

Thr Asn Phe Gln Pro Asp Tyr Pro Val Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Pro Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Lys Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val Ala Gln Gly Gly Arg Asn Lys Thr Gln Gly Val Arg Lys
 195 200 205

Ser Arg Gly Leu Glu Pro Arg Arg Arg Arg Val Lys Thr Thr Ile Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Thr Pro
 225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Thr Ser Arg Asp His His Arg
 245 250 255

Ser Pro Ser Pro Arg Glu
 260

<210> 126
 <211> 262
 <212> PRT
 <213> Heron hepatitis virus

<400> 126

Met Asp Val Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Gln Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ala Glu Thr Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met Ser Gln Ile Ala Asp Ala Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Val Pro Val Pro Glu Gly Phe Leu Ile Thr His Ser Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Asn Asp Leu Phe Ser Asn Gln Glu Glu Arg Ile
 100 105 110

Val Asn Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Thr His
 115 120 125

Leu Arg Val Tyr Thr Lys Leu Asn Glu Gln Ala Leu Asp Lys Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Thr
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Lys Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val Ala Gln Gly Gly Arg Asn Gln Thr Lys Gly Thr Arg Lys
 195 200 205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Gly Arg Arg Ser Ser Pro Ser
 225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Asn Arg Gly Asn Gln Thr Arg
 245 250 255

Ser Pro Ser Pro Arg Glu
 260

<210> 127
 <211> 564
 <212> DNA
 <213> Arctic ground squirrel hepatitis virus

<400> 127
 atggacatag atccctataa agaatttggt tcatcctacc agttgttgaa ttttcttcct 60
 ttggacttct ttcttgaact caatgccttg gtggacactg ctactgctct ctatgaagaa 120
 gaattaacag gtagggagca ctgctctcct catcacacag ctatcagaca agcttttagtt 180
 tgctgggaag aattaacaag attaattgcg tggatgagtg ctaacattaa ttcagaagaa 240
 gtaagaagag ttatagttgc tcatgtcaat gacacttggg gacttaaagt taggcagaat 300
 ttatggtttc acttatcctg tctgactttt gggcaacaca cagtgcagga atttttagtc 360
 agctttggag taaggatcag aactccggct ccttatagac ctccaatgc acccattctc 420
 tcaactcttc cggaacatac agtcattagg agaagaggaa gtgcaagagt tgtaggtcc 480
 cccagaagac gcactccctc tctcgcagg agaagatctc aatcaccgcg tcgcaggcct 540
 caatctccag cttccaactg ctga 564

<210> 128
 <211> 564
 <212> DNA
 <213> Ground squirrel hepatitis virus

<400> 128
 atggacatag atccctataa agaatttggg tcttcttatac agttgttgaa ttttcttcct 60
 ttggactttt ttctgatct caatgcattg gtggacactg ctgctgctct ttatgaagaa 120
 gaattaacag gtagggagca ttgttctcct catcactg ctattagaca ggoccttagtg 180
 tgttgggaag aattaactag attaattaca tggatgagtg aaaatacaac agaagaagtt 240
 agaagaatta ttgttgatca tgtcaataat acttggggac ttaaagtaag acagacttta 300
 tggtttcatt tatcatgtct tacttttgga caacacacag ttcaagaatt tttggttagt 360
 tttggagtat ggattagaac tccagctcct tatagaccac ctaatgcacc cattttatca 420
 actcttccgg aacatacagt cattaggaga agaggagggt caagagctgc taggtcccc 480
 cgaagacgca ctccctctcc tcgcaggaga aggtctcaat caccgcgtcg cagacgctct 540
 caatctccag cttccaactg ctga 564

<210> 129
 <211> 567
 <212> DNA
 <213> Woodchuck hepatitis virus

<400> 129
 atggacatag atccttataa agaatttggg tcatcttatac agttgttgaa ttttcttcct 60
 ttggactttt ttctgacct taatgctttg gtggacactg ctactgcctt gtatgaagaa 120
 gaactaacag gtagggaaca ttgctctccg caccatacag ctattagaca agcttttagta 180
 tgctgggatg aattaactaa attaatagct tggatgagct ctaacataac ttctgaacaa 240
 gtaagaacaa tcattgtaaa tcatgtcaat gatacctggg gacttaaggt gagacaaagt 300
 ttatggtttc atttgtcatg tctcactttc ggacaacata cagttcaaga attttttagta 360
 agttttggag tatggattag gactccagct ccatatagac ctctaatagc acccattctc 420
 tcgactcttc cggaacatac agtcattagg agaagaggag gtgcaagagc ttctaggtcc 480
 ccagaagac gcaactccctc tctcgcagg agaagatctc aatcacgcg tcgcagacgc 540
 tctcaatctc catctaccaa ctgctga 567

<210> 130
 <211> 567
 <212> DNA
 <213> Woodchuck hepatitis virus

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<400> 130
atggacatag atccctataa agaatttggg tcatcttatac agttgttgaa ttttcttcct    60
ttggacttct ttctgacct taatgctttg gtggacactg ctactgcctt gtatgaagaa    120
gagctaacag gtagggaaca ttgctctccg caccatacag ctattagaca agcttttagta    180
tgctgggatg aattaactaa attgatagct tggatgagct ctaacataac ttctgaacaa    240
gtaagaacaa tcatagtaaa tcatgtcaat gatacctggg gacttaaggt gagacaaagt    300
ttatggtttc atttgtcatg tctcactttt ggacaacata cagttcaaga attttttagta    360
agttttggag tatggatcag aactccagct ccatatagac ctccaatgc acccattctc    420
tcgactcttc cggaacatac agtcattagg agaagaggag gtgcaagagc ttctagggtcc    480
cccagaagac gcactccctc tctcgcagg agaagatctc aatcaccgcg tcgcagacgc    540
tctcaatctc catctgccaa ctgctga                                         567

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<210> 131
<211> 564
<212> DNA
<213> Woodchuck hepatitis virus

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<400> 131
atggacatag atccctataa agaatttggg tcatcttatac agttgttgaa ttttcttcct    60
ttggacttct ttctgacct taatgctttg gtggacactg ctactgcctt gtatgaagaa    120
gagctaacag gtagggaaca ttgctctccg caccatacag ctattagaca agcttttagta    180
tgctgggatg aattaactaa attgatagct tggatgagct ctaacataac ttctgaacaa    240
gtaagaacaa tcatagtaaa tcatgtcaat gatacctggg gacttaaggt gagacaaagt    300
ttatggtttc atttgtcatg tctcactttc ggacaacata cagttcaaga attttttagta    360
agttttgtag tatggatcag aactccagct ccatatagac ctccaatgc acccattctc    420
tcgactcttc cggaacatac agtcattaga agaggagggtg caagagcttc taggtcccccc    480
agaagacgca ctccctctcc tcgcaggaga agatctcaat caccgcgtcg cagacgctct    540
caatctccat ctgccaactg ctga                                         564

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<210> 132
<211> 567
<212> DNA
<213> Woodchuck hepatitis virus

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<400> 132
atggacatag atccctataa agaatttggg tcatcttatac agttgttgaa ttttcttcct    60
ttggacttct ttctgacct taatgctttg gtggacactg ctactgcctt gtatgaagaa    120
gagctaacag gtagggaaca ttgctctccg caccatacag ctattagaca agcttttagta    180
tgctgggatg aattaactaa attgatagct tggatgagct ctaacataac ttctgaacaa    240

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gtaagaacaa tcatagtaaa tcatgtcaat gatacctggg gacttaaggt gagacaaagt 300
 ttatgggtttc atttgtcatg tctcactttc ggacaacata cagttcaaga attttttagta 360
 agttttggag tatggatcag aactccagct ccatatagac ctctaatgc acccattctc 420
 tcgactcttc cggaacatac agtcattagg agaagaggag gtgcaagagc ttctaggtcc 480
 cccagaagac gcactccctc tcctcgcagg agaagatctc aatcacgcg tcgcagacgc 540
 tctcaatctc catctgccaa ctgctga 567

<210> 133
 <211> 567
 <212> DNA
 <213> Woodchuck hepatitis virus

<400> 133
 atggacatag atccttataa agaatttggg tcatcttattc agttgttgaa ttttcttctc 60
 ttggacttct ttcctgatct taatgctttg gtggacactg ctactgcctt gtatgaagaa 120
 gaactaacag gtagggaaca ttgctctccg caccatacag ctattagaca agcttttagta 180
 tgctgggatg aattaactaa attgatagct tggatgagct ctaacataac ttctgaacaa 240
 gtaagaacaa tcattgtaaa tcatgtcaat gatacctggg gacttaaggt gagacaaagt 300
 ttatgggtttc atttgtcatg tctcactttc ggacaacata cagttcaaga attttttagta 360
 agttttggag tatggatcag gactccagct ccatatagac ctctaatgc acccattctc 420
 tcgactcttc cggaacatac agtcattagg agaagaggag gtgcaagagc ttctaggtcc 480
 cccagaagac gcactccctc tcctcgcagg agaagatctc aatcacgcg tcgcagacgc 540
 tctcaatctc catctgccaa ctgctga 567

<210> 134
 <211> 552
 <212> DNA
 <213> Orangutan hepatitis virus

<400> 134
 atggacattg acccttataa agaatttggg gctactgtgg agttactctc ttttttgcct 60
 tcggatttct ttccgtctgt cagagatcta ctcgacaccg catcagccct gtatcgggaa 120
 gccttagagt ctccagaaca ttgttcacct aaccacacag cactcaggca agcagttctg 180
 tgctggggtg agttaatgac tctggcttcc tgggtgggta ataatttggg agaccagca 240
 tctaggggaa tggtagttaa ttatgtcaac aataatatgg ggctaaaaat cagacaacta 300
 ctgtgggttc acatttcctg tcttactttt ggaagagaaa cagttttaga atatttggtg 360
 tcttttggag tgtggattcg cactcctcct gcgtacagac caccaaattgc ccctatcttg 420

tcaacacttc cggaaactac tgttggttaga cgaagaggca ggtcccctag aagaagaact 480
 ccctcgccctc gcagacgaag gtctcaatca ccgcgtcgca gaagatctca atctccagct 540
 tcccaatggt ag 552

<210> 135
 <211> 549
 <212> DNA
 <213> Woolly monkey hepatitis virus

<400> 135
 atggacattg atccttataa agaatttggc gctactgttg agttattgtc ttttttgcc 60
 gctgacttct ttccttccgt acgggatttg ctggacacag cttctgctct gtatagagaa 120
 gccctggagt cttccgacca ctgttcaccg caccatactg ccttgaggca gacggtagctg 180
 tgctggggag aattaatgtc cttagcttct tgggtgggaa ctaatttggg ggatcctgct 240
 gctagagaat tagtgggttag ctatgtcaat gacaacatgg gactgaagggt gagacaactc 300
 ctttggttcc atatttcctg tctcactttt ggtagggaaa ctgttttggg atatctgggt 360
 tctttttggg tgtggatagc cacacctcct gcatatagac cacccaatgc ccctatctta 420
 tcaacacttc cggaaactac tgttggttaga cgaaggagac cctctggaag acgcactccc 480
 tcgcctcgca gacgaagatc tcaatcgccg cgtcgcagaa ggtctcaatc tccagcatct 540
 tcctgttag 549

<210> 136
 <211> 552
 <212> DNA
 <213> Gibbon hepatitis B virus

<400> 136
 atggacattg acccttataa agaatttggg gctactgttg agttactctc ttttttgcc 60
 tctgacttct ttcggtcggt tagagatctc cttgacaccg cctcagctct atatcgggaa 120
 gccctagagt ctccagaaca ttgttcacct aatcatacag cactcaggca agctgttttg 180
 tgctgggggtg agttgatgac tctggcttcc tgggtgggca ataatttggg agatccagca 240
 tctaggggaa tagtagtcag ttatgttaat aataacatgg gtctaaaaat caggcaacta 300
 ttgtgggttcc acatttcctg tcttactttt ggaagagaaa ctgtccttga gtatttagtg 360
 tcttttggag tgtggattcg cactcctcca gcttacagac caccaaatgc ccctatctta 420
 tccactcttc cggagactac tgttggttaga cgaagaggca ggtcccctag aagaagaact 480
 ccctcgccctc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctccagct 540
 tcccaatggt ag 552

<210> 137
 <211> 552
 <212> DNA
 <213> Chimpanzee hepatitis B virus

<400> 137
 atggacattg acccttataa agaatttgga gctacagtgg agttactctc ttttttgctt 60
 tctgatttct ttccgtcggg ccgtgatctc ctgcacaccg cctcagctct gtaccgggaa 120
 gccttagagt ctccagagca ctgttcacct aaccatacag cacttaggca agctatactg 180
 tgctgggggtg agttaatgac tctggcctcc tgggtgggca ataatttgga agatccagca 240
 tccagggaaac aagtagttaa ttatgtcaat accaatatgg gtttaaagat cagacaatta 300
 ttgtgggttct atatttctctg tcttactttt ggaagagaaa ctgtccttga gtatttggtg 360
 tcttttgagg tgtggattcg cactcccccc gcttatagac caccaaagtc ccctatctta 420
 tcaacacttc cggaaactac tggtgtaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgcttc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctccagct 540
 tccaatggt ag 552

<210> 138
 <211> 552
 <212> DNA
 <213> Human hepatitis B virus

<400> 138
 atggacattg acccttataa agaatttgga gctaccgtgg agttactctc gtttttgctt 60
 tctgacttct ttcttctcagt acgagatctt ctagataccg cctcagctct gtatcgggat 120
 gccttagagt ctctgagca ttgttcacct caccatactg cactcaggca agcaattctt 180
 tgctggggggg aactaatgac tctagctacc tgggtgggtg ttaatttgga agatccagca 240
 tctagggacc tagtagtcag ttatgtcaac actaatatgg gcctaaagtt cagacaactc 300
 ttgtgggttct acatttcttg tctcattttt ggaagagaaa cagttataga gtatttggtg 360
 tctttcggag tgtggattcg cactcctcca gcttatagac caccaaagtc ccctatctta 420
 tcaacacttc cggagactac tggtgtaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgcttc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
 tctcaatggt ag 552

<210> 139
 <211> 558
 <212> DNA
 <213> Human hepatitis B virus

<400> 139
 atggacattg acccttataa agaatttgga gctactgtgg agttactctc gtttttgcct 60
 tctgacttct ttccttccgt cagagatctc ctagacaccg cctcagctct gtatcgagaa 120
 gccttagagt ctctgagca ttgctcacct caccatactg cactcaggca agccattctc 180
 tgctgggggg aattgatgac tctagctacc tgggtgggta ataatttgga agatccagca 240
 tctagggatc ttgtagtaaa ttatgttaat actaacgtgg gtttaaagat caggcaacta 300
 ttgtggtttc atatatcttg ccttactttt ggaagagaga ctgtacttga atatttggtc 360
 tctttcggag tgtggattcg cactcctcca gcctatagac caccaaagtc ccctatctta 420
 tcaacacttc cggaaactac tgttgttaga cgacgggacc gaggcaggtc ccctagaaga 480
 agaactccct cgctcgag acgcagatct ccatcgccgc gtcgcagaag atctcaatct 540
 cggaatctc aatgttag 558

<210> 140
 <211> 552
 <212> DNA
 <213> Human hepatitis B virus

<400> 140
 atggacattg acccgataa agaatttgga gcttctgtgg agttactctc ttttttgcct 60
 tctgacttct ttccttctat tcgagatctc ctgcacaccg cctcagctct atatcgggag 120
 gccttagagt ctccggaaca ttgttctcct catcatacag cactcaggca agctattctg 180
 tgttgggggtg agttgatgaa tctggccacc tgggtgggaa gtaatttgga agaccagca 240
 tccagggaat tagtagtcag ctatgtcaat gttaatatgg gcctaaaaat cagacaacta 300
 ctgtggtttc acatttcttg tcttactttt ggaagagaaa ctgttcttga gtatttggtg 360
 tcttttggag tgtggattcg cactcctcct gcttacagac caccaaagtc ccctatctta 420
 tcaacacttc cggaaactac tgttgttaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgctc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
 tctcaatgtt ag 552

<210> 141
 <211> 552
 <212> DNA
 <213> Human hepatitis B virus

<400> 141
 atggacattg acccttataa agaatttgga gctactgtgg agttactctc gtttttgcct 60
 tctgacttct ttccttccgt acgagatctt ctagataaccg ccgcagctct gtatcgggat 120
 gccttagagt ctctgagca ttgttcacct caccatactg cactcaggca agcaattctt 180
 tgctgggggag acttaatgac tctagctacc tgggtgggta ctaatttaga agatccagca 240

tctagggacc tagtagtcag ttatgtcaac actaatgtgg gcctaaagtt cagacaatta 300
 ttgtgggttc acatttcttg tctcactttt ggaagagaaa cggttctaga gtatttggtg 360
 tcttttggag tgtggattcg cactcctcca gcttatagac caccaaagtc ccctatccta 420
 tcaacgcttc cggagactac tgttggttaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgcttc gcagacgaag atctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
 tctcaatggt ag 552

<210> 142
 <211> 552
 <212> DNA
 <213> Human hepatitis B virus

<400> 142
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 gccttagagt ctccggaaca ttgttcacct caccatacag cactcaggca agctattctg 180
 tgttgggggtg agttgatgaa tttggccacc tgggtgggaa gtaatttgga agaccagca 240
 tccagggaat tagtagtcag ctatgtcaat gttaatatgg gcctaaaaat cagacaacta 300
 ttgtgggttc atatttcttg tcttactttt ggaagagaaa ctgttcttga gtatttggtg 360
 tcttttggag tgtggattcg cactcctccc gcttacagac caccaaagtc ccctatctta 420
 tcaacacttc cggaaactac tgttggttaga cgacgaggca ggtcccctag aagaagaact 480
 ccctcgcttc gcagacgaag gtctcaatcg ccgcgtcgca gaagatctca atctcgggaa 540
 tctcaatggt ag 552

<210> 143
 <211> 786
 <212> DNA
 <213> Ross' goose hepatitis virus

<400> 143
 atggatatca acgcttcaag agcttttagct aatgtatatg atttgccaga tgatttcttt 60
 ccaaagattg atgatttagt tagagatgct aaagatgctt tagagcctta ttggagaaat 120
 gattcaataa agaaacatgt ttttaattgca actcactttg tggatctcat tgaggatttc 180
 tggcaaacca ctcagggtat gcatgaaata gcagaggcac tgagagctat aattcctgcc 240
 actactgctc cagtacctca gggatttctg gtccaacacg aagaagctga agagatacct 300
 ttgggtgaac tttttaggta tcaggaagaa agactaacta actttcaacc agattatcca 360
 gttaccgcca gaattcatgc tcacctgaaa gcatatgcaa aaataaatga ggaatcttta 420
 gatagagcta ggagattgct ttggtggcat tataactggt tattgtgggg cgagcctaac 480

gttaccaact atattttcgag attaagaact tggttatcca cacctgaaaa atacagagga 540
 aaagatgccc caaccattga agcaatcact agaccaatcc aagtggcgca gggaggcaga 600
 aataagactc agggagttag aaaatctcgt ggactcgaac ctaggagaag aagagttaaa 660
 accacaattg tctatgggag aagacgttca aagtccaggg aaaggagagc ccctacaccc 720
 cagcgtgcgg gctcccctct cccgcgtact tctagggacc accacagatc tccctcgcct 780
 agggaa 786

<210> 144
 <211> 789
 <212> DNA
 <213> Heron hepatitis virus

<400> 144
 atggatgtca atgcttcaag agcttttagca aatgtatatg atctgccaga tgatttcttt 60
 cctcagattg atgatcttgt tagagatgct aaggatgctt tagaacctta ttggaaagcc 120
 gaaacaataa agaaacatgt tttaatttct actcactttg tggatttgat tgaggacttc 180
 tggcagacca ctcaggggat gagccaaatt gcagacgccc tccgagcagt aattccacct 240
 actaccgtac cagtaccgga gggttttctc attactcata gtgaggcaga agagatcccc 300
 ttgaacgatc tcttttcaaa tcaagaggag aggatagtca atttccaacc tgactatccc 360
 attacagcta gaattcatac ccacttacgt gtttatacta aattgaatga acaagctttg 420
 gacaaagctc gcagattgct ttggtggcat tacaattgcc tcctctgggg agaagccact 480
 gttacaaatt atatttctcg cctccgtact tggctttcta ctcccgaaaa atatcgaggc 540
 aaggatgccc caaccattga agcaatcact agaccaatcc aggtggctca aggaggcaga 600
 aatcaaacta agggaactag aaaacctcgt ggactcgaac ctagaagacg aaaggttaaa 660
 accacagttg tctatgggag aagacgttct aagtcctgag gcaggagatc ctctccatcc 720
 caacgtgcgg gctcccctct cccacgtaat cggggaaacc agacacgatc ccctcacct 780
 agggaatag 789

<210> 145
 <211> 786
 <212> DNA
 <213> Duck hepatitis virus

<400> 145
 atggatatca atgcttctag agccttagca aatgtgtatg atctgcctga tgatttcttt 60
 ccaaaaatag atgatcttgt aagggatgct aaagacgctt tagaacctta ttggaaatct 120
 gactcaataa agaaacatgt tttaattgca actcattttg tggatcttat tgaggatttt 180
 tggcagacta cgcaggggat gcatgaaatc gctgaatcac taagagcagt aattccacct 240

accactgctc ctgttcctac tgggtatctc attcagcacg aagaggcaga agagatacca	300
ttaggtgatt tatttaaaca tcaagaagaa agaatagtca gtttccaacc tgactacca	360
attacagcaa gaattcatgc acacctaaaa gcatatgcaa aaattaacga ggaatcattg	420
gacggggcta ggagattgct ttggtggcat tataactgtt tactgtgggg agaagctaac	480
gttactaatt atatttctcg cctccgtact tggttgtcaa ctctgaaaa gtacagaggt	540
cgagatgccc caaccattga agcaatcact agaccaatcc aagtggctca gggaggcaga	600
aaaacatctt cgggaactag aaaacctcgt ggactcgaac ctagaagaag aaaagttaaa	660
accacatttg tctatgggag aagacgttca aagtccaggg aaaggagagc cccttcaccc	720
caacgtgcgg gctcccctct cccacgtagt tcgagcagcc accatagatc tccctcgct	780
aggaaa	786

<210> 146
 <211> 789
 <212> DNA
 <213> Duck hepatitis virus

<400> 146	
atggatatca atgcttctag agccttagcc aatgtgtatg atctaccaga tgatttcttt	60
ccaaaaatag atgatcttgt tagagatgct aaagacgctt tagagcctta ttggaaatca	120
gattcaataa agaaacatgt tttgattgca actcactttg tggatcttat tgaagacttc	180
tggcagacta cacagggcat gcatgaaata gccgaatcct taagagctgt tatacctccc	240
actactactc ctgttccacc gggttatctt attcagcacg aagaagctga agagatacct	300
ttgggagatt tatttaaaca ccaagaagaa aggatagtga gtttccaacc cgactatcca	360
attacggcta gaattcatgc tcatttgaaa gcttatgcaa aaattaacga ggaatcactg	420
gatagggcta ggagattgct ttggtggcat tacaattgtt tactgtgggg agaagctcaa	480
gttactaact atatttctcg cttgcgtact tggttgtcaa ctctgagaa atatagaggt	540
agagatgccc cgaccattga agcaatcact agaccaatcc aagtggctca gggaggcca	600
aaaacaacta cgggtactag aaaacctcgt ggactcgaac ctagaagaag aaaagttaaa	660
accacagttg tctatgggag aagacgttca aagtccggg aaaggagagc ccctacaccc	720
caacgtgcgg gctcccctct cccacgtagt tcgagcagcc accatagatc tccctcgct	780
aggaaataa	789

<210> 147
 <211> 789
 <212> DNA
 <213> Duck hepatitis virus

<400> 147
 atggatatca atgcttctag agccttagcc aatgtgtatg atctgccaga tgatttcttc 60
 cctaaaattg atgatcttgt aagggatgct aaagacgcat tagaacctta ttggaaatct 120
 gattcaataa agaaacatgt ttttaattgca actcactttg tggatcttat tgaagacttt 180
 tggcagacta ctcagggtat gcatgaaatt gctgaatcct taagagctgt aataccacct 240
 acgactgctc ctgtacctac tgggtatctc attcaacacg aggaagctga agagataacct 300
 ttaggtgatt tatttaaaca tcaggaagaa agaatagtca gtttccaacc tgactatcct 360
 attacagcaa gaattcatgc acacctaaaa gcttatgcta aaattaatga ggaatcgttg 420
 gatagggcta ggagattgct ttggtggcat tacaactggt tactgtgggg agaagctaac 480
 gttactaatt atatttctcg gctccgtact tggttgtcaa ctctgaaaa gtacagaggc 540
 cgtgatgccc caaccattga agcaatcact agaccaatcc aggtggctca gggaggcaga 600
 aaaacatctt cggaactag aaaacctcgt ggactcgaac ctagaagaag aaaagttaaa 660
 accacagttg tctatgggag aagacgttca aagtccaggg ataggagagc cccttcaccc 720
 caacgtgcgg gctccctct cccacgtagt tcgagcagcc accatagatc tcctcgcct 780
 aggaaataa 789

<210> 148
 <211> 789
 <212> DNA
 <213> Duck hepatitis virus

<400> 148
 atggatatca atgcttctag agccttagcc aatgtatatg atctgccaga tgatttcttt 60
 ccaaaaattg atgatcttgt aagggatgct aaagatgctt tagaacctta ttggaaatct 120
 gattcaataa agaaacatgt ttttaattgca actcacttcg tggatcttat tgaagacttc 180
 tggcagacta cacagggtat gcatgagata gctgaatcat taagagcagt aattccacct 240
 accactgctc ctgtacctac ggggtatctc attcaacacg aagaggctga agagataacct 300
 ttaggtgata ttttcaaaca tcaggaagaa aggatagtta gtttccagcc agactatccg 360
 attactgcta gaattcatgc acatctaaaa gcttatgcta aaattaatga ggaatcatta 420
 gatcgggcta ggagattgct ttggtggcat tacaactggt tactgtgggg agaagctaac 480
 gttaccaact atatttctcg gctccgtact tggttgtcaa ctctgaaaa gtaccgaggc 540
 cgtgatgccc caaccattga agcaatcact agaccaatcc aagtggctca gggaggcaga 600
 aaaacatctt cggaactag aaaacctcgt ggactcgaac ctagaagaag aaaagttaaa 660

accacagttg tctatgggag aagacgttca aagtcgccgg aaaggagagc cccttcaccc 720
 caacgtgcgg gctccctct cccacgtagt tcgagcagcc accatagatc tccctcgctt 780
 aggaaataa 789

<210> 149
 <211> 789
 <212> DNA
 <213> Duck hepatitis virus

<400> 149
 atggatatca atgcttctag agccttagcc aatgtatatg atctgccaga tgattttcttt 60
 ccaaaaattg atgatcttgt aagggatgct aaagacgctt tagaacctta ctggaaatct 120
 gattcaataa agaaacatgt tttgattgca actcactttg tggatcttat tgaagacttc 180
 tggcagacta ctcagggtat gcatgaaatt gctgaatcct taagagcagt aataccacct 240
 accactgctc ctgtacctac tggatatctc attcaacacg aggaggctga agagataccc 300
 ttaggtgatt tatttaaaaca tcaggaagaa agaatagtca gttttcaacc agactatcct 360
 attacagcaa gaattcatgc acacctaaaa gcttatgcaa aaattaatga ggaatctttg 420
 gatagggcta ggagattgct ttggtggcat tacaactgtt tactgtgggg agaagctaac 480
 gttactaatt acatttctcg gctccgtact tggttgtcaa ctccggaaaa gtaccgaggc 540
 cgtgatgccc caaccattga agcaatcact agaccaatcc aagcggctca gggaggcaga 600
 aaaacatctt cggaactag aaaacctcgt ggactcgaac ctagaagaag aaaagttaaa 660
 accacagttg tctatgggag aagacgttca aagtcgccgg aaaggagagc cccttcaccc 720
 caacgtgcgg gctccctct cccacgtagt tcgagcagcc accatagatc tccctcgctt 780
 aggaaataa 789

<210> 150
 <211> 789
 <212> DNA
 <213> Duck hepatitis virus

<400> 150
 atggatatca atgcttctag agccttagcc aatgtatatg atctgccaga tgattttcttt 60
 ccaaaaattg atgatcttgt aagggatgct aaagacgctt tagaacctta ctggaaatct 120
 gattcaataa agaaacatgt tttgattgca actcactttg tggatcttat tgaagacttc 180
 tggcagacta ctcagggtat gcatgaaatt gctgaatcct taagagcagt aataccacct 240
 accactgctc ctgtacctac tggatatctc attcaacacg aggaggctga agagataccc 300
 ttaggtgatt tatttaaaaca tcaggaagaa agaatagtca gttttcaacc agactatcct 360
 attacagcaa gaattcatgc acacctaaaa gcttatgcaa aaattaatga ggaatctttg 420

gatagggcta ggagattgct ttggtggcat tacaactgtt tactgtgggg agaagctaac 480
gttactaatt acatttctcg gctccgtact tggttgtcaa ctccggaaaa gtaccgaggg 540
cgtgatgccc caaccattga agcaatcact agaccaatcc aagcggctca gggaggcaga 600
aaaacatctt cggaactag aaaacctcgt ggactcgaac ctagaagaag aaaagttaaa 660
accacagttg tctatgggag aagacgttca aagtccaggg aaaggagagc cccttcaccc 720
caacgtgcgg gctcccctct cccacgtagt tcgagcagcc accatagatc tccctcgct 780
aggaaataa 789

<210> 151
<211> 262
<212> PRT
<213> Sheldgoose hepatitis virus

<400> 151

Met Asp Val Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
20 25 30

Ala Leu Glu Pro Tyr Trp Arg Ser Glu Ser Ile Lys Lys His Val Leu
35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
50 55 60

Gln Gly Met His Glu Ile Ala Glu Ala Leu Arg Ala Val Ile Pro Pro
65 70 75 80

Thr Thr Thr Pro Val Pro Pro Gly Tyr Leu Ile Gln His Glu Glu Ala
85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Lys Ala Arg
130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Arg Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val Ala Gln Gly Gly Arg Asn Lys Thr Gln Gly Ser Arg Lys
 195 200 205

Pro Arg Gly Leu Gln Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Asp Arg Arg Ala Pro Ser Pro
 225 230 235 240

Gln Arg Ala Gly Ser Pro Leu Pro Arg Pro Ser Thr Ser His His Arg
 245 250 255

Ser Pro Ser Pro Arg Lys
 260

<210> 152
 <211> 262
 <212> PRT
 <213> Stork hepatitis virus
 <400> 152

Met Asp Val Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Gln Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ala Glu Thr Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met Ser Gln Ile Ala Asp Ala Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Thr Pro Val Pro Asp Gly Tyr Leu Ile Ser His Asn Glu Ala
 85 90 95

Gln Glu Leu Pro Leu Asn Asp Leu Phe Val Asn Gln Glu Glu Arg Ile
 100 105 110

Val Asn Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Thr His
 115 120 125

Leu Arg Val Tyr Thr Lys Leu Asn Glu Gln Ala Leu Asp Lys Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ser Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Lys Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val Ala Gln Gly Ser Arg Asn Gln Thr Lys Gly Val Arg Lys
 195 200 205

Pro Arg Gly Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val
 210 215 220

Tyr Gly Arg Arg Arg Ser Lys Ser Arg Gly Arg Arg Ser Ser Pro Ser
 225 230 235 240

Gln Arg Ala Gly Ser Pro Ile Pro Arg Asn Arg Glu Asn Gln Ser Arg
 245 250 255

Ser Ser Ser Pro Arg Glu
 260

<210> 153

<211> 38

<212> PRT

<213> Arctic ground squirrel hepatitis virus

<400> 153

Arg Arg Arg Gly Ser Ala Arg Val Val Arg Ser Pro Arg Arg Thr
 1 5 10 15

Pro Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Arg Arg Arg Pro Gln
 20 25 30

Ser Pro Ala Ser Asn Cys
 35

<210> 154
 <211> 149
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus

<400> 154

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ser Ser Tyr Gln Leu Leu
 1 5 10 15

Asn Phe Leu Pro Leu Asp Phe Phe Pro Glu Leu Asn Ala Leu Val Asp
 20 25 30

Thr Ala Thr Ala Leu Tyr Glu Glu Glu Leu Thr Gly Arg Glu His Cys
 35 40 45

Ser Pro His His Thr Ala Ile Arg Gln Ala Leu Val Cys Trp Glu Glu
 50 55 60

Leu Thr Arg Leu Ile Ala Trp Met Ser Ala Asn Ile Asn Ser Glu Glu
 65 70 75 80

Val Arg Arg Val Ile Val Ala His Val Asn Asp Thr Trp Gly Leu Lys
 85 90 95

Val Arg Gln Asn Leu Trp Phe His Leu Ser Cys Leu Thr Phe Gly Gln
 100 105 110

His Thr Val Gln Glu Phe Leu Val Ser Phe Gly Val Arg Ile Arg Thr
 115 120 125

Pro Ala Pro Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu His Thr Val Ile
 145

<210> 155
 <211> 33
 <212> PRT
 <213> Woolly monkey hepatitis virus

<400> 155

Arg Arg Arg Arg Pro Ser Gly Arg Arg Thr Pro Ser Pro Arg Arg Arg
 1 5 10 15

Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Ala Ser Ser
 20 25 30

Cys

<210> 156
 <211> 149
 <212> PRT
 <213> Woolly monkey hepatitis virus
 <400> 156

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ala Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Ser Asp His Cys
 35 40 45

Ser Pro His His Thr Ala Leu Arg Gln Thr Val Leu Cys Trp Gly Glu
 50 55 60

Leu Met Ser Leu Ala Ser Trp Val Gly Thr Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ala Arg Glu Leu Val Val Ser Tyr Val Asn Asp Asn Met Gly Leu Lys
 85 90 95

Val Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Trp Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val
 145

<210> 157
 <211> 34
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 157

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
 1 5 10 15

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Ala Ser
 20 25 30

Gln Cys

<210> 158

<211> 149

<212> PRT

<213> Orangutan hepatitis virus

<400> 158

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro Asn His Thr Ala Leu Arg Gln Ala Val Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Ser Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Leu Val Val Asn Tyr Val Asn Asn Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val
 145

<210> 159
 <211> 34
 <212> PRT
 <213> Gibbon hepatitis B virus

<400> 159

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
 1 5 10 15

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Ala Ser
 20 25 30

Gln Cys

<210> 160
 <211> 149
 <212> PRT
 <213> Gibbon hepatitis B virus

<400> 160

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro Asn His Thr Ala Leu Arg Gln Ala Val Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Ser Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Leu Val Val Ser Tyr Val Asn Asn Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val
 145

<210> 161
 <211> 34
 <212> PRT
 <213> Chimpanzee hepatitis B virus
 <400> 161

Arg Arg Arg Gly Arg Ser Pro Arg Arg Arg Thr Pro Ser Pro Arg Arg
 1 5 10 15

Arg Arg Ser Gln Ser Pro Arg Arg Arg Arg Ser Gln Ser Pro Ala Ser
 20 25 30

Gln Cys

<210> 162
 <211> 149
 <212> PRT
 <213> Chimpanzee hepatitis B virus
 <400> 162

Met Asp Ile Asp Pro Tyr Lys Glu Phe Gly Ala Thr Val Glu Leu Leu
 1 5 10 15

Ser Phe Leu Pro Ser Asp Phe Phe Pro Ser Val Arg Asp Leu Leu Asp
 20 25 30

Thr Ala Ser Ala Leu Tyr Arg Glu Ala Leu Glu Ser Pro Glu His Cys
 35 40 45

Ser Pro Asn His Thr Ala Leu Arg Gln Ala Ile Leu Cys Trp Gly Glu
 50 55 60

Leu Met Thr Leu Ala Ser Trp Val Gly Asn Asn Leu Glu Asp Pro Ala
 65 70 75 80

Ser Arg Glu Gln Val Val Asn Tyr Val Asn Thr Asn Met Gly Leu Lys
 85 90 95

Ile Arg Gln Leu Leu Trp Phe His Ile Ser Cys Leu Thr Phe Gly Arg
 100 105 110

Glu Thr Val Leu Glu Tyr Leu Val Ser Phe Gly Val Trp Ile Arg Thr
 115 120 125

Pro Pro Ala Tyr Arg Pro Pro Asn Ala Pro Ile Leu Ser Thr Leu Pro
 130 135 140

Glu Thr Thr Val Val
 145

<210> 163
 <211> 67
 <212> PRT
 <213> Duck hepatitis virus

<400> 163

Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15

Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Phe Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro Gln Arg Ala
 35 40 45

Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg Ser Pro Ser
 50 55 60

Pro Arg Lys
 65

<210> 164
 <211> 195
 <212> PRT
 <213> Duck hepatitis virus

<400> 164

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80
 Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95
 Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110
 Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125
 Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140
 Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160
 Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175
 Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190
 Ile Gln Val
 195
 <210> 165
 <211> 67
 <212> PRT
 <213> Duck hepatitis virus
 <400> 165
 Ala Gln Gly Gly Arg Lys Thr Thr Thr Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15
 Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30
 Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Thr Pro Gln Arg Ala
 35 40 45
 Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg Ser Pro Ser
 50 55 60
 Pro Arg Lys
 65

<210> 166
 <211> 195
 <212> PRT
 <213> Duck hepatitis virus

<400> 166

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Thr Pro Val Pro Pro Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Gln
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val
 195

<210> 167
 <211> 67
 <212> PRT
 <213> Duck hepatitis virus

<400> 167

Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15

Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Asp Arg Arg Ala Pro Ser Pro Gln Arg Ala
 35 40 45

Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg Ser Pro Ser
 50 55 60

Pro Arg Lys
 65

<210> 168
 <211> 195
 <212> PRT
 <213> Duck hepatitis virus

<400> 168

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val
 195

<210> 169
 <211> 67
 <212> PRT
 <213> Duck hepatitis virus

<400> 169

Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15

Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro Gln Arg Ala
 35 40 45

Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg Ser Pro Ser
 50 55 60

Pro Arg Lys
 65

<210> 170
 <211> 195
 <212> PRT
 <213> Duck hepatitis virus

<400> 170

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Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
1           5           10           15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
          20           25           30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
          35           40           45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
          50           55           60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
65           70           75           80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
          85           90           95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
          100          105          110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
          115          120          125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
          130          135          140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
145           150           155           160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
          165          170          175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
          180          185          190

Ile Gln Val
          195

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<210> 171

<211> 67

<212> PRT

<213> Duck hepatitis virus

<400> 171

Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15

Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro Gln Arg Ala
 35 40 45

Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg Ser Pro Ser
 50 55 60

Pro Arg Lys
 65

<210> 172

<211> 195

<212> PRT

<213> Duck hepatitis virus

<400> 172

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Ala
 195

<210> 173
 <211> 67
 <212> PRT
 <213> Duck hepatitis virus

<400> 173

Ala Gln Gly Gly Arg Lys Thr Ser Ser Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15

Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Ser Pro Gln Arg Ala
 35 40 45

Gly Ser Pro Leu Pro Arg Ser Ser Ser Ser His His Arg Ser Pro Ser
 50 55 60

Pro Arg Lys
 65

<210> 174
 <211> 195
 <212> PRT
 <213> Duck hepatitis virus

<400> 174

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ser Asp Ser Ile Lys Lys His Val Leu
35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
50 55 60

Gln Gly Met His Glu Ile Ala Glu Ser Leu Arg Ala Val Ile Pro Pro
65 70 75 80

Thr Thr Ala Pro Val Pro Thr Gly Tyr Leu Ile Gln His Glu Glu Ala
85 90 95

Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
100 105 110

Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
165 170 175

Lys Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
180 185 190

Ile Gln Ala
195

<210> 175
<211> 67
<212> PRT
<213> Ross' goose hepatitis virus
<400> 175

Ala Gln Gly Gly Arg Asn Lys Thr Gln Gly Val Arg Lys Ser Arg Gly
1 5 10 15

Leu Glu Pro Arg Arg Arg Arg Val Lys Thr Thr Ile Val Tyr Gly Arg
20 25 30

Arg Arg Ser Lys Ser Arg Glu Arg Arg Ala Pro Thr Pro Gln Arg Ala
35 40 45

Gly Ser Pro Leu Pro Arg Thr Ser Arg Asp His His Arg Ser Pro Ser
 50 55 60

Pro Arg Glu
 65

<210> 176
 <211> 195
 <212> PRT
 <213> Ross' goose hepatitis virus
 <400> 176

Met Asp Ile Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Arg Asn Asp Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ala Leu Arg Ala Ile Ile Pro Ala
 65 70 75 80

Thr Thr Ala Pro Val Pro Gln Gly Phe Leu Val Gln His Glu Glu Ala
 85 90 95

Glu Glu Ile Pro Leu Gly Glu Leu Phe Arg Tyr Gln Glu Glu Arg Leu
 100 105 110

Thr Asn Phe Gln Pro Asp Tyr Pro Val Thr Ala Arg Ile His Ala His
 115 120 125

Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Arg Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Pro Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Lys Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val
 195

<210> 177
 <211> 67
 <212> PRT
 <213> Sheldgoose hepatitis virus
 <400> 177

Ala Gln Gly Gly Arg Asn Lys Thr Gln Gly Ser Arg Lys Pro Arg Gly
 1 5 10 15

Leu Gln Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Asp Arg Arg Ala Pro Ser Pro Gln Arg Ala
 35 40 45

Gly Ser Pro Leu Pro Arg Pro Ser Thr Ser His His Arg Ser Pro Ser
 50 55 60

Pro Arg Lys
 65

<210> 178
 <211> 195
 <212> PRT
 <213> Sheldgoose hepatitis virus
 <400> 178

Met Asp Val Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Lys Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Arg Ser Glu Ser Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met His Glu Ile Ala Glu Ala Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Thr Pro Val Pro Pro Gly Tyr Leu Ile Gln His Glu Glu Ala
 85 90 95
 Glu Glu Ile Pro Leu Gly Asp Leu Phe Lys His Gln Glu Glu Arg Ile
 100 105 110
 Val Ser Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Ala His
 115 120 125
 Leu Lys Ala Tyr Ala Lys Ile Asn Glu Glu Ser Leu Asp Lys Ala Arg
 130 135 140
 Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Asn
 145 150 155 160
 Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175
 Arg Tyr Arg Gly Arg Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190
 Ile Gln Val
 195

<210> 179
 <211> 67
 <212> PRT
 <213> Heron hepatitis virus

<400> 179

Ala Gln Gly Gly Arg Asn Gln Thr Lys Gly Thr Arg Lys Pro Arg Gly
 1 5 10 15
 Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30
 Arg Arg Ser Lys Ser Arg Gly Arg Arg Ser Ser Pro Ser Gln Arg Ala
 35 40 45
 Gly Ser Pro Leu Pro Arg Asn Arg Gly Asn Gln Thr Arg Ser Pro Ser
 50 55 60
 Pro Arg Glu
 65

<210> 180
 <211> 195
 <212> PRT
 <213> Heron hepatitis virus
 <400> 180
 Met Asp Val Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15
 Asp Asp Phe Phe Pro Gln Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30
 Ala Leu Glu Pro Tyr Trp Lys Ala Glu Thr Ile Lys Lys His Val Leu
 35 40 45
 Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60
 Gln Gly Met Ser Gln Ile Ala Asp Ala Leu Arg Ala Val Ile Pro Pro
 65 70 75 80
 Thr Thr Val Pro Val Pro Glu Gly Phe Leu Ile Thr His Ser Glu Ala
 85 90 95
 Glu Glu Ile Pro Leu Asn Asp Leu Phe Ser Asn Gln Glu Glu Arg Ile
 100 105 110
 Val Asn Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Thr His
 115 120 125
 Leu Arg Val Tyr Thr Lys Leu Asn Glu Gln Ala Leu Asp Lys Ala Arg
 130 135 140
 Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ala Thr
 145 150 155 160
 Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175
 Lys Tyr Arg Gly Lys Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190
 Ile Gln Val
 195

<210> 181
 <211> 67
 <212> PRT
 <213> Stork hepatitis virus

<400> 181

Ala Gln Gly Ser Arg Asn Gln Thr Lys Gly Val Arg Lys Pro Arg Gly
 1 5 10 15

Leu Glu Pro Arg Arg Arg Lys Val Lys Thr Thr Val Val Tyr Gly Arg
 20 25 30

Arg Arg Ser Lys Ser Arg Gly Arg Arg Ser Ser Pro Ser Gln Arg Ala
 35 40 45

Gly Ser Pro Ile Pro Arg Asn Arg Glu Asn Gln Ser Arg Ser Ser Ser
 50 55 60

Pro Arg Glu
 65

<210> 182
 <211> 195
 <212> PRT
 <213> Stork hepatitis virus

<400> 182

Met Asp Val Asn Ala Ser Arg Ala Leu Ala Asn Val Tyr Asp Leu Pro
 1 5 10 15

Asp Asp Phe Phe Pro Gln Ile Asp Asp Leu Val Arg Asp Ala Lys Asp
 20 25 30

Ala Leu Glu Pro Tyr Trp Lys Ala Glu Thr Ile Lys Lys His Val Leu
 35 40 45

Ile Ala Thr His Phe Val Asp Leu Ile Glu Asp Phe Trp Gln Thr Thr
 50 55 60

Gln Gly Met Ser Gln Ile Ala Asp Ala Leu Arg Ala Val Ile Pro Pro
 65 70 75 80

Thr Thr Thr Pro Val Pro Asp Gly Tyr Leu Ile Ser His Asn Glu Ala
 85 90 95

Gln Glu Leu Pro Leu Asn Asp Leu Phe Val Asn Gln Glu Glu Arg Ile
 100 105 110

Val Asn Phe Gln Pro Asp Tyr Pro Ile Thr Ala Arg Ile His Thr His
 115 120 125

Leu Arg Val Tyr Thr Lys Leu Asn Glu Gln Ala Leu Asp Lys Ala Arg
 130 135 140

Arg Leu Leu Trp Trp His Tyr Asn Cys Leu Leu Trp Gly Glu Ser Asn
 145 150 155 160

Val Thr Asn Tyr Ile Ser Arg Leu Arg Thr Trp Leu Ser Thr Pro Glu
 165 170 175

Lys Tyr Arg Gly Lys Asp Ala Pro Thr Ile Glu Ala Ile Thr Arg Pro
 180 185 190

Ile Gln Val
 195

<210> 183
 <211> 22
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus

<400> 183

Ala Ala Gly Ser Ala Arg Val Val Arg Ser Pro Ser Gln Ser Pro Gln
 1 5 10 15

Ser Pro Ala Ser Asn Cys
 20

<210> 184
 <211> 21
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus

<400> 184

Ala Ala Gly Ser Ala Arg Val Val Arg Ser Ser Gln Ser Pro Gln Ser
 1 5 10 15

Pro Ala Ser Asn Cys
 20

<210> 185
<211> 20
<212> PRT
<213> Arctic ground squirrel hepatitis virus

<400> 185

Ala Ala Gly Ser Ala Arg Val Val Arg Ser Ser Gln Ser Gln Ser Pro
1 5 10 15

Ala Ser Asn Cys
20

<210> 186
<211> 19
<212> PRT
<213> Arctic ground squirrel hepatitis virus

<400> 186

Ala Ala Gly Ser Ala Arg Val Val Arg Ser Ser Gln Ser Gln Ser Ala
1 5 10 15

Ser Asn Cys

<210> 187
<211> 14
<212> PRT
<213> Arctic ground squirrel hepatitis virus

<400> 187

Arg Arg Gly Ser Ala Arg Val Val Ser Gln Ala Ser Asn Cys
1 5 10

<210> 188
<211> 14
<212> PRT
<213> Arctic ground squirrel hepatitis virus

<400> 188

Ala Arg Gly Ser Ala Arg Val Val Ser Gln Ala Ser Asn Cys
1 5 10

<210> 189
<211> 14
<212> PRT
<213> Arctic ground squirrel hepatitis virus

<400> 189

Arg Ala Gly Ser Ala Arg Val Val Ser Gln Ala Ser Asn Cys
1 5 10

<210> 190
 <211> 14
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 190

Ala Ala Gly Ser Ala Arg Val Val Ser Gln Ala Ser Asn Cys
 1 5 10

<210> 191
 <211> 17
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 191

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Gln Ser Arg Glu Ser Gln
 1 5 10 15

Cys

<210> 192
 <211> 17
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 192

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Gln Ser Pro Ala Ser Asn
 1 5 10 15

Cys

<210> 193
 <211> 16
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 193

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Gln Ser Ala Ser Asn Cys
 1 5 10 15

<210> 194
 <211> 14
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 194

Ala Ala Gly Arg Ser Gln Ser Pro Gln Ser Ala Ser Asn Cys
 1 5 10

<210> 195
 <211> 15
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 195

Ala Ala Gly Arg Ser Pro Ser Gln Ser Gln Ser Ala Ser Asn Cys
 1 5 10 15

<210> 196
 <211> 13
 <212> PRT
 <213> Arctic ground squirrel hepatitis virus
 <400> 196

Ala Ala Gly Arg Ser Gln Ser Gln Ser Ala Ser Asn Cys
 1 5 10

<210> 197
 <211> 18
 <212> PRT
 <213> Woolly monkey hepatitis virus
 <400> 197

Ala Ala Arg Pro Ser Pro Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser
 1 5 10 15

Ser Cys

<210> 198
 <211> 16
 <212> PRT
 <213> Woolly monkey hepatitis virus
 <400> 198

Ala Ala Arg Pro Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser Ser Cys
 1 5 10 15

<210> 199
 <211> 15
 <212> PRT
 <213> Woolly monkey hepatitis virus
 <400> 199

Ala Ala Arg Pro Ser Gln Ser Ser Gln Ser Pro Ala Ser Ser Cys
 1 5 10 15

<210> 200
<211> 14
<212> PRT
<213> Woolly monkey hepatitis virus

<400> 200

Ala Ala Arg Pro Ser Gln Ser Ser Gln Ser Ala Ser Ser Cys
1 5 10

<210> 201
<211> 13
<212> PRT
<213> Woolly monkey hepatitis virus

<400> 201

Arg Arg Gly Ser Gln Ser Arg Arg Ser Gln Ser Ser Cys
1 5 10

<210> 202
<211> 13
<212> PRT
<213> Woolly monkey hepatitis virus

<400> 202

Ala Arg Gly Ser Gln Ser Arg Arg Ser Gln Ser Ser Cys
1 5 10

<210> 203
<211> 13
<212> PRT
<213> Woolly monkey hepatitis virus

<400> 203

Arg Ala Gly Ser Gln Ser Arg Arg Ser Gln Ser Ser Cys
1 5 10

<210> 204
<211> 13
<212> PRT
<213> Woolly monkey hepatitis virus

<400> 204

Ala Ala Gly Ser Gln Ser Arg Arg Ser Gln Ser Ser Cys
1 5 10

<210> 205
 <211> 18
 <212> PRT
 <213> Woolly monkey hepatitis virus

<400> 205

Ala Ala Arg Arg Arg Pro Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser
 1 5 10 15

Ser Cys

<210> 206
 <211> 17
 <212> PRT
 <213> Woolly monkey hepatitis virus

<400> 206

Ala Ala Arg Arg Arg Pro Ser Gln Ser Pro Ser Gln Ser Ala Ser Ser
 1 5 10 15

Cys

<210> 207
 <211> 16
 <212> PRT
 <213> Woolly monkey hepatitis virus

<400> 207

Ala Ala Arg Arg Arg Pro Ser Gln Ser Pro Ser Gln Ser Ser Ser Cys
 1 5 10 15

<210> 208
 <211> 14
 <212> PRT
 <213> Woolly monkey hepatitis virus

<400> 208

Ala Ala Arg Arg Ser Gln Ser Pro Ser Gln Ser Ser Ser Cys
 1 5 10

<210> 209
 <211> 15
 <212> PRT
 <213> Woolly monkey hepatitis virus

<400> 209

Ala Ala Arg Arg Ser Pro Ser Gln Ser Ser Gln Ser Ser Ser Cys
 1 5 10 15

<210> 210
 <211> 13
 <212> PRT
 <213> Woolly monkey hepatitis virus
 <400> 210

Ala Ala Arg Arg Ser Gln Ser Ser Gln Ser Ser Ser Cys
 1 5 10

<210> 211
 <211> 18
 <212> PRT
 <213> Orangutan hepatitis virus
 <400> 211

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser
 1 5 10 15

Gln Cys

<210> 212
 <211> 16
 <212> PRT
 <213> Orangutan hepatitis virus
 <400> 212

Ala Ala Gly Arg Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser Gln Cys
 1 5 10 15

<210> 213
 <211> 15
 <212> PRT
 <213> Orangutan hepatitis virus
 <400> 213

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Pro Ala Ser Gln Cys
 1 5 10 15

<210> 214
 <211> 14
 <212> PRT
 <213> Orangutan hepatitis virus
 <400> 214

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Ala Ser Gln Cys
 1 5 10

<210> 215
 <211> 11
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 215

Arg Arg Gly Ser Gln Ser Pro Ala Ser Gln Cys
 1 5 10

<210> 216
 <211> 11
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 216

Ala Arg Gly Ser Gln Ser Pro Ala Ser Gln Cys
 1 5 10

<210> 217
 <211> 11
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 217

Arg Ala Gly Ser Gln Ser Pro Ala Ser Gln Cys
 1 5 10

<210> 218
 <211> 11
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 218

Ala Ala Gly Ser Gln Ser Pro Ala Ser Gln Cys
 1 5 10

<210> 219
 <211> 18
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 219

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Pro Ala Ser
 1 5 10 15

Gln Cys

<210> 220
 <211> 17
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 220

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Ala Ser Gln
 1 5 10 15

Cys

<210> 221
 <211> 16
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 221

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Gln Ser Ser Gln Cys
 1 5 10 15

<210> 222
 <211> 15
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 222

Ala Ala Gly Arg Ser Gln Ser Pro Ser Gln Ser Ala Ser Gln Cys
 1 5 10 15

<210> 223
 <211> 16
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 223

Ala Ala Gly Arg Ser Pro Ser Gln Ser Ser Gln Ser Ala Ser Gln Cys
 1 5 10 15

<210> 224
 <211> 14
 <212> PRT
 <213> Orangutan hepatitis virus

<400> 224

Ala Ala Gly Arg Ser Gln Ser Ser Gln Ser Ala Ser Gln Cys
 1 5 10

<210> 225
 <211> 23
 <212> PRT
 <213> Duck hepatitis virus

<400> 225

Ala Ala Gly Gly Glu Arg Gly Val Arg Ser Pro Ser Gln Ser Pro Ser
 1 5 10 15

Arg Ser Pro Ser Pro Arg Lys
 20

<210> 226
 <211> 21
 <212> PRT
 <213> Duck hepatitis virus

<400> 226

Ala Ala Gly Gly Glu Arg Gly Val Arg Ser Gln Ser Pro Ser Arg Ser
 1 5 10 15

Pro Ser Pro Arg Lys
 20

<210> 227
 <211> 20
 <212> PRT
 <213> Duck hepatitis virus

<400> 227

Ala Ala Gly Gly Glu Arg Gly Val Arg Ser Gln Ser Ser Arg Ser Pro
 1 5 10 15

Ser Pro Arg Lys
 20

<210> 228
 <211> 19
 <212> PRT
 <213> Duck hepatitis virus

<400> 228

Ala Ala Gly Gly Glu Arg Gly Val Arg Ser Gln Ser Ser Arg Ser Ser
 1 5 10 15

Pro Arg Lys

<210> 229
 <211> 15
 <212> PRT
 <213> Duck hepatitis virus

<400> 229

Arg Arg Gly Gly Ala Arg Ala Ser Arg Ser Pro Ser Pro Arg Lys
 1 5 10 15

<210> 230
 <211> 15
 <212> PRT
 <213> Duck hepatitis virus

<400> 230

Ala Arg Gly Gly Ala Arg Ala Ser Arg Ser Pro Ser Pro Arg Lys
 1 5 10 15

<210> 231
 <211> 15
 <212> PRT
 <213> Duck hepatitis virus

<400> 231

Arg Ala Gly Gly Ala Arg Ala Ser Arg Ser Pro Ser Pro Arg Lys
 1 5 10 15

<210> 232
 <211> 15
 <212> PRT
 <213> Duck hepatitis virus

<400> 232

Ala Ala Gly Gly Ala Arg Ala Ser Arg Ser Pro Ser Pro Arg Lys
 1 5 10 15

<210> 233
 <211> 19
 <212> PRT
 <213> Duck hepatitis virus

<400> 233

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Ser Arg Ser Pro Ser
 1 5 10 15

Pro Arg Lys

<210> 234
 <211> 19
 <212> PRT
 <213> Duck hepatitis virus

<400> 234

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Ser Arg Ser Pro Ser
 1 5 10 15

Pro Arg Glu

<210> 235
 <211> 18
 <212> PRT
 <213> Duck hepatitis virus

<400> 235

Ala Ala Gly Arg Ser Pro Ser Gln Ser Pro Ser Ser Arg Ser Ser Pro
 1 5 10 15

Arg Glu

<210> 236
 <211> 16
 <212> PRT
 <213> Duck hepatitis virus

<400> 236

Ala Ala Gly Arg Ser Gln Ser Pro Ser Ser Arg Ser Ser Pro Arg Glu
 1 5 10 15

<210> 237
 <211> 16
 <212> PRT
 <213> Duck hepatitis virus

<400> 237

Ala Ala Gly Arg Ser Pro Ser Gln Ser Ser Arg Ser Ser Pro Arg Glu
 1 5 10 15

<210> 238
 <211> 14
 <212> PRT
 <213> Duck hepatitis virus

<400> 238

Ala Ala Gly Arg Ser Gln Ser Ser Arg Ser Ser Pro Arg Glu
 1 5 10

<210> 239
 <211> 20
 <212> PRT
 <213> Tetanus toxin

<400> 239

Ile Asp Lys Ile Ser Asp Val Ser Thr Ile Val Pro Tyr Ile Gly Pro
 1 5 10 15

Ala Leu Asn Ile
 20

<210> 240
 <211> 21
 <212> PRT
 <213> Tetanus toxin

<400> 240

Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser Ala
 1 5 10 15

Ser His Leu Glu Gln
 20

<210> 241
 <211> 21
 <212> PRT
 <213> Tetanus toxin

<400> 241

Phe Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser
 1 5 10 15

Ala Ser His Leu Glu
 20

<210> 242
 <211> 14
 <212> PRT
 <213> Tetanus toxin

<400> 242

Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu
 1 5 10

<210> 243
 <211> 16
 <212> PRT
 <213> Tetanus toxin

<400> 243

Val Ser Ile Asp Lys Phe Arg Ile Phe Cys Lys Ala Leu Asn Pro Lys
 1 5 10 15

<210> 244
 <211> 16
 <212> PRT
 <213> Tetanus toxin

<400> 244

Leu Lys Phe Ile Ile Lys Arg Tyr Thr Pro Asn Asn Glu Ile Asp Ser
 1 5 10 15

<210> 245
 <211> 19
 <212> PRT
 <213> Diptheria toxin

<400> 245

Pro Leu Phe Ala Gly Ala Asn Tyr Ala Ala Trp Ala Val Asn Val Ala
 1 5 10 15

Gln Val Ile

<210> 246
 <211> 20
 <212> PRT
 <213> Diptheria toxin

<400> 246

Val His His Asn Thr Glu Glu Ile Val Ala Gln Ser Ile Ala Leu Ser
 1 5 10 15

Ser Leu Met Val
 20

<210> 247
 <211> 20
 <212> PRT
 <213> Diptheria toxin

<400> 247

Gln Ser Ile Ala Leu Ser Ser Leu Met Val Ala Gln Ala Ile Pro Leu
 1 5 10 15

Val Gly Glu Leu
 20

<210> 248

<211> 20

<212> PRT

<213> Diptheria toxin

<400> 248

Gln Gly Glu Ser Gly His Asp Ile Lys Ile Thr Ala Glu Asn Thr Pro
 1 5 10 15

Leu Pro Ile Ala
 20

<210> 249

<211> 20

<212> PRT

<213> Diptheria toxin

<400> 249

Val Asp Ile Gly Phe Ala Ala Tyr Asn Phe Val Glu Ser Ile Ile Asn
 1 5 10 15

Leu Phe Gln Val
 20

<210> 250

<211> 20

<212> PRT

<213> Diptheria toxin

<400> 250

Gly Val Leu Leu Pro Thr Ile Pro Gly Lys Leu Asp Val Asn Lys Ser
 1 5 10 15

Lys Thr His Ile
 20

<210> 251
 <211> 20
 <212> PRT
 <213> Plasmodium falciparum

<400> 251

Glu Tyr Leu Asn Lys Ile Gln Asn Ser Leu Ser Thr Glu Trp Ser Pro
 1 5 10 15

Cys Ser Val Thr
 20

<210> 252
 <211> 20
 <212> PRT
 <213> Plasmodium falciparum

<400> 252

Asp Ile Glu Lys Lys Ile Cys Lys Met Glu Lys Cys Ser Ser Val Phe
 1 5 10 15

Asn Val Val Asn
 20

<210> 253
 <211> 15
 <212> PRT
 <213> Hepatitis B virus

<400> 253

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp
 1 5 10 15

<210> 254
 <211> 13
 <212> PRT
 <213> Influenza virus

<400> 254

Pro Lys Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr
 1 5 10

<210> 255
 <211> 16
 <212> PRT
 <213> Influenza virus

<400> 255

Tyr Ser Gly Pro Leu Lys Ala Glu Ile Ala Gln Arg Leu Glu Asp Val
 1 5 10 15

<210> 256
<211> 18
<212> PRT
<213> Measles virus

<400> 256

Lys Leu Leu Ser Leu Ile Lys Gly Val Ile Val His Arg Leu Glu Gly
1 5 10 15

Val Glu